15-18) drawn to a process for the manufacture of a copper alloy product and classified in class 148, subclass 554+. In a telephone conversation with Applicants' attorney on January 21, 2000, a provisional election was made to prosecute the invention of group I, claims 1-14. Applicants affirm this election with traverse.

The Examiner indicated that the process embodied in claim 15 could be used to make other and materially different products, such as an aluminum base alloy product. Applicants respectfully traverse. The preamble to claim 15 identifies certain properties of the manufactured strip such as a relatively high electrical conductivity and a resistance to stress relaxation at relatively elevated temperatures such as 125°C. One element of the claim is the casting of a copper alloy having a specific alloy composition. This element limits the process to the formation of copper alloys having specific properties. It is Applicants' belief that only the product of Group I could successfully be made were all elements of the process claim 15 included, notably the casting composition. Accordingly, it is believed appropriate for the Examiner to combine the product and process claims for purpose of examination. Removal of the restriction requirement and examination of all pending claims on the merits is respectfully requested.

In the event that the Examiner repeats the restriction requirement and makes it final, Applicants reaffirm the election of the group I claims, claims 1-14.

The Examiner next objected to Applicants' Abstract of the Disclosure as too short and not providing the invention in detail. Applicants traverse the objection as to length in that the Abstract contains in excess of 50 words in accordance with MPEP guidelines. A substitute Abstract is enclosed with this Office Action providing more detail about the claimed alloy. It is believed that the substitute Abstract renders this objection moot.

Claims 13 and 14 were rejected under 35 U.S.C. 112, second paragraph, as indefinite. The Examiner objected to the expression "a resistance to stress relaxation at 125°C" as merely a relative expression. The expression has been deleted from the claims rendering the rejection under this section moot.

Applicants' claim 1, as amended, is drawn to a brass alloy containing, by weight, 5% to 25% of zinc, 0.3%-2% of nickel, 0.15%-1% tin, 0.03%-0.35% phosphorous and the balance is copper and inevitable impurities. The amounts of nickel and phosphorous are controlled to achieve a nickel to phosphorous weight ratio of between 3.5:1 and 7.5:1.

Claims 1, 2, 6 and 10 were rejected under 35 U.S.C. 102(b) as anticipated by JP 5-311,292, specifically sample number 13 disclosed in that publication.

Applicants' claim 1, as amended, claims a minimum nickel content of 0.3%. This is in accord with Applicants' specification at page 6, line 168. There is therefore, no overlap with reference alloy 13 and the rejection under 35 U.S.C. 102 should be removed.

JP 5-311,292 is drawn to a copper based alloy intended for use as a car radiator or a domestic heat exchanger. While the alloy composition disclosed in the abstract of the publication has similarity to the composition ranges claimed by Applicants, the reference discloses a nickel to phosphorous weight ratio of between 5 and 50. In the examples, the weight ratio ranges between 5.4 for reference alloy 13 and 65 for reference alloy 16. There is nothing in the reference to teach or suggest maintaining the nickel to phosphorous ratio between 3.5:1 and 7.5:1 as claimed by Applicants for increasing both strength and electrical conductivity as disclosed in Applicants' specification at page 8, lines 192-193. Since the reference is drawn to car radiators and domestic heat exchangers, it is not believed that electrical conductivity is an important consideration in the reference and the reference leads one skilled in the art to an excess nickel content in the alloy relative to the phosphorous content. As disclosed in Applicants' specification at page 6, lines 165-166, if the nickel content is excessive, electrical conductivity is detrimentally affected.

Applicants' claim 1, and the claims dependent therefrom, should be allowed over JP 5-311,292.

Claims 1-3 and 6-14 were rejected under 35 U.S.C. 103 as unpatentable over any one of U.S. Patent No. 4,362,579; JP 4-354,843; JP 6-184,679; JP 59-126,742; and JP 7-126,779.

U.S. 4,362,579 discloses a copper base alloy containing, by weight, 10%-35% zinc, 0.4%-8% nickel, 0.01%-1% tin, 0.001%-0.1% phosphorous and 0.1%-3% silicon. Applicants' claim 1 as

amended requires less than 0.1% silicon in conformance with Applicants' specification at page 14, line 349 through page 15, line 355. It is further noted that the U.S. reference is silent on the nickel to phosphorous ratio, but discloses potential ratios of between 4:1 (0.4 Ni/0.1P) up to 8,000 (8Ni/0.001P). There is no recognition in this reference of the desirability to maintain high strength and electrical conductivity through a nickel to phosphorous ratio of between 3.5:1 and 7.5:1 as claimed by Applicants. Applicants' claims should be allowed over the U.S. reference.

JP 4-354,843 is drawn to a copper alloy for use as a heat exchanger. While the alloy composition disclosed in the Abstract is similar to that claimed by Applicants, there is no teaching or suggestion of maintaining a nickel to phosphorous ratio of between 3.5:1 and 7.5:1 to maintain high strength and high electrical conductivity. Rather, the disclosed ranges encompass nickel to phosphorous ratios of between 2.5:1 and 300:1. Applicants' claims should be allowed over JP 4-354,843.

JP 6-184,679 discloses at column 2, [0004] a copper alloy containing 5-30% zinc, 0.1%-1% nickel, 0.5-2.5% tin, 0.005%-0.4% phosphorous as useful for connectors and other lead material. There is no recognition of a nickel to phosphorous ratio of between 3.5:1 and 7.5:1 as claimed by Applicants. Rather, the reference discloses nickel:phosphorous ratios of between 0.25:1(0.1Ni/0.4P) up to 200 (1 Ni/0.005P). Applicants' claims should be allowed over the cited Japanese reference.

JP 59-126,742 is drawn to a copper alloy for use as a welded tube. This is a high zinc alloy requiring a minimum of 25% zinc and further does not recognize a critical nickel to phosphorous ratio to maintain high strength and high electrical conductivity. Applicants' claims should be allowed over the cited reference.

JP 7-126,779 discloses a copper alloy for use as an electrical connector. The alloy contains nickel, tin and phosphorous and may optionally include zinc. There is no recognition of a critical nickel to phosphorous ratio and ratios of between 0.2:1 and 3000:1 are possible from the disclosed composition. There is nothing in this reference to teach or suggest Applicants' claimed alloy with a required nickel to phosphorous ratio of between 3.5:1 and 7.5:1. Applicants' claims should be allowed over the cited reference.

Claims 1-4 and 6-14 were rejected under 35 U.S.C. 103 as unpatentable over U.S. Patent No. 4,971,758; JP 5-311,294; JP 5-311,295; and JP 6-228,684.

U.S. 4,971,758 discloses a copper alloy with a maximum of 3% of zinc. The reference further discloses at column 3, line 59 that if the zinc content exceeds 3%, the copper base alloy connector has degraded solderability. Accordingly, this reference would not motivate one skilled in the art to form a copper base alloy containing a minimum of 5% zinc as claimed by the Applicants. Applicants' Applicants' claims should be allowed over the cited U.S. Patent.

JP 5-311,294 is drawn to a copper base alloy for heat exchangers that has a mandatory inclusion of boron and further a nickel to phosphorous ratio of 15. There is nothing in the reference to teach or suggest forming a copper base alloy having high strength and high electrical conductivity with a nickel to phosphorous ratio in the range of 3.5:1 to 7.5:1 and Applicants' claims should be allowed over this cited Japanese reference.

JP 5-311,295 is drawn to a copper base alloy for heat exchangers that requires a nickel to manganese ratio of 19.2:1. There is no recognition in the reference that to maintain high strength and high electrical conductivity, the nickel to phosphorous ratio should be maintained between 3.5:1 and 7.5:1.

JP 6-228,684 discloses a copper base alloy containing specified amounts of zinc, nickel, silicon, tin, iron, phosphorous and either magnesium and/or calcium. The alloy is disclosed as useful as an electrical connector. There is nothing in the reference to teach or suggest obtaining high electrical conductivity and strength by maintaining a nickel to phosphorous ratio of between 3.5:1 and 7.5:1. The disclosed compositions in the Japanese reference provide for a nickel to phosphorous ratio of between 0.5:1 and 3000:1. Applicants' claims should be allowed over the cited Japanese reference.

Claims 1-5, 7-9 and 14 were rejected under 35 U.S.C. 103 in view of any one of U.S. Patent No. 5,508,001; JP 4-231,430; JP 5-59,467; JP 7-331,363; JP 6-299,275; and JP 9-209,061.

U.S. 5,508,001 discloses a copper base alloy containing between 0.1% and 3% of zinc. There is nothing in the reference to teach or suggest a copper alloy with a minimum of 5% zinc as claimed by Applicants having both high strength and high electrical conductivity.

JP 4-231,430 is drawn to a copper alloy containing a minimum of 0.1% of beryllium which is outside the range of Applicants' claim 1 as amended that claims less than 0.1% beryllium in conformance with Applicants' specification at page 14, line 353. There is nothing in the Japanese reference to teach or suggest a nickel to phosphorous critical ratio to achieve high electrical conductivity and high strength.

JP 5-59,467 discloses a copper alloy that in its Abstract excludes the presence of nickel. There is nothing in this reference to teach or suggest Applicants' claimed alloy.

JP 7-331,363 discloses a copper alloy containing a maximum of 3% of zinc and does not teach or suggest Applicants' claimed alloy.

JP 6-299,275 discloses a copper alloy that requires a minimum of 0.1% silicon and does not teach or suggest Applicants' alloy that contains less than 0.1% silicon and a nickel to phosphorous ratio of between 3.5:1 and 7.5:1. Applicants' claims should be allowed over the cited reference.

JP 9-209,061 discloses a copper alloy containing a maximum of 3% of zinc and does not teach or suggest Applicants' claimed alloy.

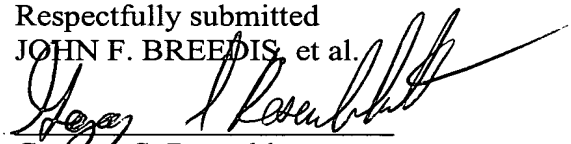
Claims 1-14 were rejected under 35 U.S.C. 103 as unpatentable over JP 6-179,932. The reference is drawn to a copper alloy containing zinc, magnesium, sulphur and oxygen and may optionally include tin, phosphorous and nickel. Since phosphorous and nickel are both optional inclusions, there is nothing in the reference to teach or suggest a critical nickel to phosphorous ratio and Applicants' claims should be allowed over the cited reference.

It is respectfully solicited that none of the references teach or suggest a copper alloy with a composition as claimed by Applicants and a nickel to phosphorous ratio within the narrow range of 3.5:1 and 7.5:1 to thereby achieve the unique combination of high strength and high electrical conductivity. While many of the references contain both nickel and phosphorous and by taking the limits on the disclosed nickel and phosphorous ranges of the references, ratios may be established, the possible ratio ranges are typically orders of magnitude larger than the range identified and claimed by Applicants. Accordingly, even if Applicants' claimed range is overlapped by the unrecognized but calculable ratios of the references, there is no recognition in any of the references of the criticality of

this ratio. Accordingly, Applicants' claims should be allowed over the cited references. In view of the extremely large ranges obtainable by dividing the limits of the references, more than routine experimentation would be required to achieve the unique benefits of Applicants' alloys. Applicants' alloys should be deemed allowable over all cited references .

Entry of this Amendment and reconsideration of the claims as amended is respectfully requested. If the Examiner requires any additional information, he is invited to contact Applicants' attorney at the telephone number listed below.

Respectfully submitted
JOHN F. BREEDIS, et al.



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